

**Work Order ID-56491**

February 25, 2010 7:32:43 AM

Page 1

Item ID: D3391-023

Accept

Revision ID:

Item Name: Mid Tube Assembly

Start Date: 2/25/10 Start Qty: 1.00

Required Date: 3/05/10 Req'd Qty: 1.00

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Draw Nbr

Revision Nbr

D3391

Rev H

100

0.00



Skidtubes

Skidtubes

Skidtubes

Memo

0.00

1-Cut tube to finish length as per Dwg D3391

2-Identify as D3391-023

3-Drill pilot holes using DT8796 (Do not drill "B" holes) and drill only 1 fwd saddle hole on one side only as per Dwg D3391

4-Open saddles and GHW holes to Ø0.375" except for fwd saddle hole of detail "J"

5-Remove .030" from Fwd indexing Ridge as per Dwg D3391

6-Remove indexing ridge on Fwd &amp; Aft end of skidtube as per Dwg D3391

7-Deburr

8-Drill #30 pilot holes using wearplate Jig DT8217 Identify Ø0.250" holes with paint marker,

9-Open wearplate holes of D3391-023 assembly detail section G-G to Ø0.250" (14 holes) as per Dwg D3391 and 2 holes in section Detail "J", do not open wearplate holes of section "J"

10-Open wearplate holes of D3391-023 assembly detail section H-H to Ø0.297" (20 holes) as per Dwg D3391

4/10/2/25

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Work Order ID 56491

February 25, 2010 7:32:44 AM



Page 2

Item ID: D3391-023

Accept



Setup Start



Revision ID:

Stop



Item Name: Mid Tube Assembly

Start Date: 2/25/10 Start Qty: 1.00



Cust Item ID:

Required Date: 3/05/10 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

11-Open .375" holes to .438" \*\*\*do not open fwd saddle holes\*\*\*

4 0/2/25

12-Locate D3391-021 in D3391-023 at 9.00" (see view z-z)

13- Transfer drill one fwd saddle hole only to .188" dia, transfer drill all remaining fwd saddle holes using DT 8149 locating from previously drill .188" dia hole, using t-pins and clicos to ensure perfect allingment, open up previously tranfer drilled pilot holes in D3391-023/-021 to 0.438" dia. in D3391-021

4 0/3/11

14- Transfer drill 2 wearplate holes into D3391-021 using DT8217, locating from two previously drilled holes, drill remaining wearplate holes into D3391-021.

15- Locating from two fwd wearplate holes drilol remaining 6 wearplate holes in D3391-021 using DT8937

16- Open 2 fwd wearplate holes in D3391-023 to .250" dia.

17- counterbore two aft wearplate holes in D3391-021 as per dwg

18- Open 12 wearplate holes in D3391-021 to 0.297" dia.

19-Deburr and blow out all chips from inside tube

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                                |                                 |                |                           |                       |                          |
|------|------|----------------------------------|--------------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action<br>Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng           | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Work Order ID 56491

February 25, 2010 7:32:45 AM

Page 3

Item ID: D3391-023

Accept

Revision ID:

Item Name: Mid Tube Assembly

Start Date: 2/25/10 Start Qty: 1.00

Required Date: 3/05/10 Req'd Qty: 1.00

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

110

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

120

Chemical Conversion Coat per QSI005 4.1

0.00



HandFinish

Memo

0.00

Hand Finishing

130

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control



Setup

Start



Stop



Cust Item ID:

Customer:

Run

Start



Stop



8106361

⑩

BE 10/03/02

⑨

M 0/3/2

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
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|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

NOTE: Date & initial all entries

# Work Order ID 56491

February 25, 2010 7:32:45 AM

Page 4

Item ID: D3391-023

Accept

Revision ID:

Item Name: Mid Tube Assembly

Setup Start

Stop

Start Date: 2/25/10 Start Qty: 1.00

Required Date: 3/05/10 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

140



Skidtubes

Skidtubes

Skidtubes

Memo

0.00

1-Open float bag holes as per dwg  
2-C'sink float bag holes as per dwg  
3- Prepare tube for welding  
4-Bond web in place as per Dwg D3391 & QSI 015.  
Adhere for 12 hours)  
A/R Sikaflex exp: 08/2010  
batch#: M112429

BE 10/03/02

150



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

DP 10-3-3

160



Skidtubes

Skidtubes

Skidtubes

Memo

0.00

1-Weld crossbolt spacer as per dwg D3391 & QSI 004  
2-grind weld flush

BE 10/03/03

# Work Order ID 56491

February 25, 2010 7:32:46 AM

Page 5

Item ID: D3391-023

Accept

Revision ID:

Item Name: Mid Tube Assembly

Start Date: 2/25/10 Start Qty: 1.00

Required Date: 3/05/10 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

170

QC10- Inspect visual per QSI004- ground welds

0.00

*Solo 10/5/05*

0.00

QC

Memo

Quality Control

180

QC5- Inspect part completeness to step on W/O

0.00

*Solo 10/5/05*

0.00

QC

Memo

Quality Control

185

*— pressure wash*  
*— Reallocate as per PAR09-043*

*= 7 m-h 10/05/05*

*(XL)*

*(1X)*

190

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00

*= 1/4 10/05/05*

0.00

Powdercoat

Memo

Powder Coating

START TIME: *1:30pm*  
OVEN TEMPERATURE: *320°F*  
FINISH TIME: *2:00pm*



# Work Order ID 56491

February 25, 2010 7:32:53 AM

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Item ID: D3391-023

Revision ID:

Item Name: Mid Tube Assembly

Start Date: 2/25/10 Start Qty: 1.00

Required Date: 3/05/10 Req'd Qty: 1.00

Reference:

Approvals: Process Plan:

QC:

Date:

Date:

Tooling:

SPC (Y/N):

Date:

Date:

Run Start

Stop

Sequence ID/  
Work Center ID

200



QC

Quality Control

Operation  
Description

QC3- Inspect Part Finish

Memo

Set Up/  
Run Hours

0.00

Draw  
Number

0.00

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

= 7 m-l 10/05/10

210



Skidtubes

Skidtubes

Skidtubes

Memo

0.00

0.00

= 7 m-l 10/07/07 xl ø

1- insert D3391-021 into D3391-23

2- insert T-pins into first and third fwd saddle holes

3- ON FIRST SIDE ONLY drill out 2nd and forth fwd saddles holes to 0.500" as per DSI 9364

4- remove T-pins and locate DT9415 from first and third crossbolt hole using T-pins and clekos

5- ON 2ND SIDE ONLY ream out 2nd and forth saddle hole to 0.499". Remove DT9415

6- deburr, re-alodine and blow out chips

7- press fit D3591-1 spacers using DT9416 starting from 0.500" side

# Work Order ID 56491

February 25, 2010 7:32:53 AM

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Item ID: D3391-023

Accept

Revision ID:

Item Name: Mid Tube Assembly

Start Date: 2/25/10 Start Qty: 1.00

Required Date: 3/05/10 Req'd Qty: 1.00

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

220

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

81267102

230

HandFinishing

0.00



HandFinish

Memo

0.00

Hand Finishing

Install Inserts as per Dwg

=> M 16/07/07

X1

240

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

81267102

⊕

# Work Order ID 56491

February 25, 2010 7:32:59 AM

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Item ID: D3391-023

Revision ID:

Item Name: Mid Tube Assembly

Start Date: 2/25/10 Start Qty: 1.00

Required Date: 3/05/10 Req'd Qty: 1.00

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

250

Identify as per dwg & Stock Location: \_\_\_\_\_

0.00

0.00

Packaging

Packaging

used on

W/ 56382  
Memo

2794

10/07/07

①

Ø

D412-742-043

260

QC21- Final Inspection - Work Order Release

0.00

0.00

QC

Quality Control

Memo



1007-08

mf 10-7-8

# Picklist Print

February 25, 2010 7:32:42 AM

Page 1/3

Work Order ID: 56491

Parent Item: D3391-023

Parent Item Name: Mid Tube Assembly

Comments: IPP A 05.10.20 New Issue KJ/EC  
 IPP B 06.02.10 ECN773 dwg rev.D EC  
 IPP C 07.03.20 rev F dwg EC  
 IPP D 07.03.28 re-format EC

Start Date: 2/25/10

Required Date: 3/05/10

Start Qty: 1.00

Required Qty: 1.00

D2500-1-1000



Skidtube Extrusion

Manufactured No 100 Each 137.0000 1.0000



Warehouse Loc Qty Loc Code  
Location

Main Warehouse

If 87

50251 87

Main Warehouse

ST 50

37065 50

D3391-021



Fwd Tube Assembly

D3389-1



Web

Manufactured No 100 Each 0.0000 1.0000

B 56214



Manufactured No 140 Each 1.0000 1.0000

B 56214



Warehouse Loc Qty Loc Code  
Location

Main Warehouse

ST 1

48244 1

B 56510

①

BE 10/03/02

1 M 10/2/25

1 M 10/3/1

1 M 10/3/1

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Picklist Print

February 25, 2010 7:32:42 AM

Page 2 / 3

Work Order ID: 56491

Parent Item: D3391-023

Parent Item Name: Mid Tube Assembly

Comments: IPP A 05.10.20 New Issue! KJ/EC  
 IPP B 06.02.10 ECN773 dwg rev.D EC..  
 IPP C 07.03.20 rev F dwg EC  
 IPP D 07.03.28 re-format EC

Start Date: 2/25/10

Required Date: 3/05/10

Start Qty: 1.00

Required Qty: 1.00



Manufactured No 160 Each 39.0000 5.0000

Warehouse Loc Qty Loc Code  
Location

Main Warehouse

LG 37

51920 20

52898 17

Main Warehouse

ST 2

47123 2

E5 BE 10/03/03



Manufactured No 210 Each 37.0000 2.0000

Warehouse Loc Qty Loc Code  
Location

Main Warehouse

ST 37

46105 29

47121 8

1357350

x2 w 10/07/07

February 25, 2010 7:32:42 AM

Shop Packet Print

Page 2

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |  |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |  |
|      |      |                    |    |      |     |                                     |                          |  |
|      |      |                    |    |      |     |                                     |                          |  |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Picklist Print

February 25, 2010 7:32:42 AM

Page 3 13

Work Order ID: 56491



Parent Item: D3391-023



Parent Item Name: Mid Tube Assembly

Start Date: 2/25/10

Required Date: 3/05/10

Comments: IPP A 05.10.20 New Issue  
IPP B 06.02.10 ECN773 dwg rev.D  
IPP C 07.03.20 rev F dwg  
IPP D 07.03.28 re-format

KJ/ECN  
ECN  
EC  
EC

Start Qty: 1.00

Required Qty: 1.00

ALS4-1032-130

Purchased

No

230

Each

1,678.000 22.0000



Insert

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

1678

110511

1678

M 114723

122 M 16107107



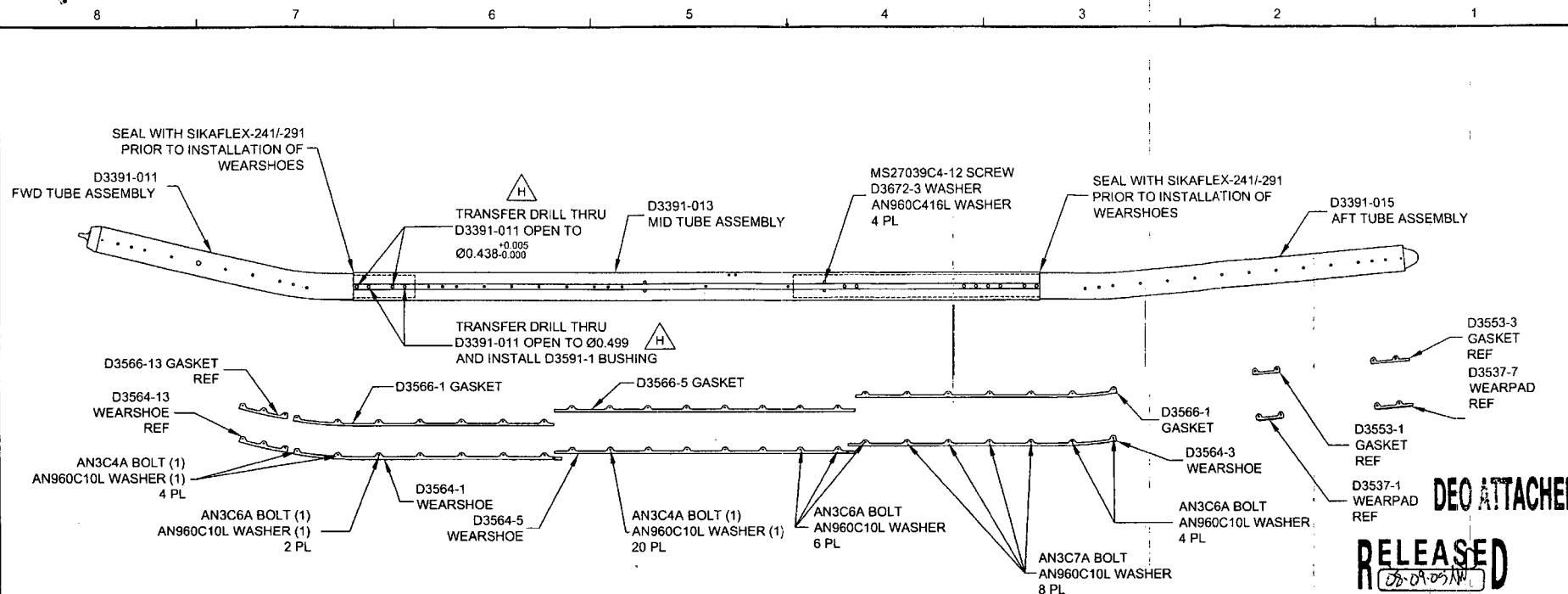
| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |  |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |  |
|      |      |                    |    |      |     |                                     |                          |  |
|      |      |                    |    |      |     |                                     |                          |  |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
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|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries



**D3391-041 ASSEMBLY**

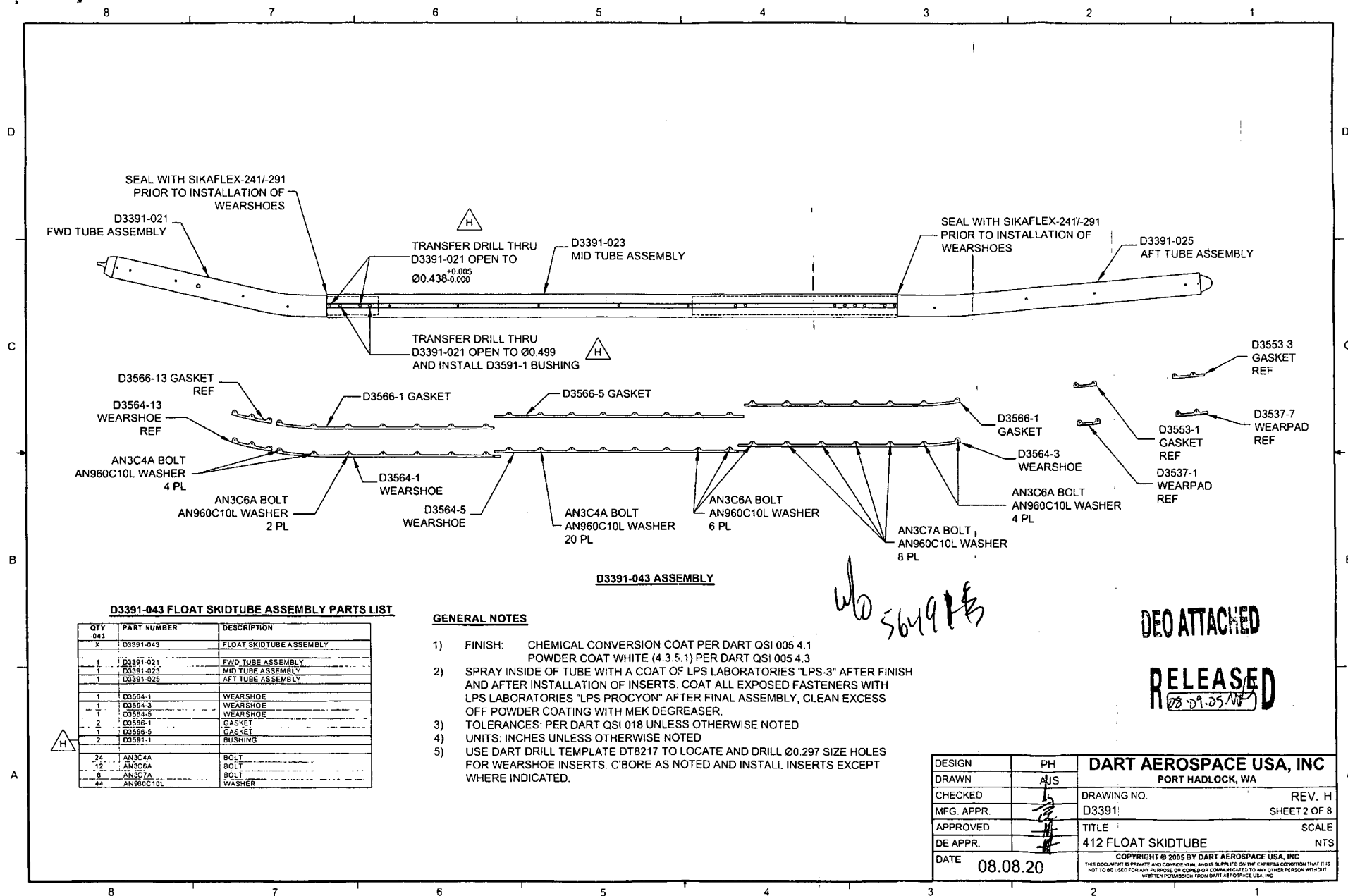
**D3391-041 FLOAT SKIDTUBE ASSEMBLY PARTS LIST**

| QTY | PART NUMBER  | DESCRIPTION             |
|-----|--------------|-------------------------|
| X   | D3391-041    | FLOAT SKIDTUBE ASSEMBLY |
| 1   | D3391-011    | FWD TUBE ASSEMBLY       |
| 1   | D3391-013    | MID TUBE ASSEMBLY       |
| 1   | D3391-015    | AFT TUBE ASSEMBLY       |
| 1   | D3564-1      | WEARSHOE                |
| 1   | D3564-3      | WEARSHOE                |
| 1   | D3564-5      | WEARSHOE                |
| 2   | D3566-1      | GASKET                  |
| 2   | D3566-5      | GASKET                  |
| 2   | D3566-13     | GASKET                  |
| 4   | D3672-3      | WASHER                  |
| 24  | AN3C4A       | BOLT                    |
| 12  | AN3C6A       | BOLT                    |
| 8   | AN3C7A       | BOLT                    |
| 44  | AN960C10L    | WASHER                  |
| 4   | MS27039C4-12 | SCREW                   |
| 4   | AN960C416L   | WASHER                  |

**GENERAL NOTES**

- 1) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- 2) SPRAY INSIDE OF TUBE WITH A COAT OF LPS LABORATORIES "LPS-3" AFTER FINISH AND AFTER INSTALLATION OF INSERTS. COAT ALL EXPOSED FASTENERS WITH LPS LABORATORIES "LPS PROCYON" AFTER FINAL ASSEMBLY, CLEAN EXCESS OFF POWDER COATING WITH MEK DEGREASER.
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 SIZE HOLES FOR WEARSHOE INSERTS. C'BORE AS NOTED AND INSTALL INSERTS EXCEPT WHERE INDICATED.

|            |   |   |              |
|------------|---|---|--------------|
| H          | DRAWING UPDATED TO CURRENT STANDARDS.<br>SHT 1 PL ADDED D3591-1 BUSHING. ZN C6 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. SHT 2 PL ADDED D3591-1 BUSHING. ZN C6 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. (FOR FURTHER INFO SEE DSI 9364 & NCR 08-074) | AJS   | 08.08.20     |
| G          | REPLACE NAS INSERTS W/ AELS INSERTS<br>SWITCH TO D3670-XXXX SPACERS FOR INSTALLING<br>FLOAT BAGS, DWG REORGANIZED FOR CLARITY   | DC  | 07.07.31     |
| F          | ADD SS WEARSHOE, GASKET<br>REMOVE FWD SADDLE HOLE -011/-021   | PH  | 07.01.18     |
| E          | CHANGE TOLERANCE, EASE MANUFACTURE  | PH  | 06.04.25     |
| D          | UPDATE TOLERANCE, CHANGE HOLE SIZE  | PH  | 06.01.23     |
| C          | LENGTHEN AFT EXTENSION  | PH  | 05.09.27     |
| B          | DRAWING UPDATES   | PH  | 05.06.10     |
| A          | NEW ISSUE   | PH  | 05.02.07     |
| REV        | DESCRIPTION   | BY  | DATE         |
| DESIGN     | PH  | <b>DART AEROSPACE USA, INC</b>  |              |
| DRAWN      | A/S   | PORT HADLOCK, WA  |              |
| CHECKED    |   | DRAWING NO.   | REV. H       |
| MFG. APPR. |   | D3391   | SHEET 1 OF 8 |
| APPROVED   |   | TITLE   | SCALE        |
| DE APPR.   |   | 412 FLOAT SKIDTUBE  | NTS          |
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**D3391-043 FLOAT SKIDTUBE ASSEMBLY PARTS LIST**

| QTY | PART NUMBER | DESCRIPTION             |
|-----|-------------|-------------------------|
| X   | D3391-043   | FLOAT SKIDTUBE ASSEMBLY |
| 1   | D3391-021   | FWD TUBE ASSEMBLY       |
| 1   | D3391-023   | MID TUBE ASSEMBLY       |
| 1   | D3391-025   | AFT TUBE ASSEMBLY       |
| 1   | D3564-1     | WEARSHOE                |
| 1   | D3564-3     | WEARSHOE                |
| 1   | D3564-5     | WEARSHOE                |
| 1   | D3566-1     | GASKET                  |
| 2   | D3566-5     | GASKET                  |
| 2   | D3591-1     | BUSHING                 |
| 24  | AN3C4A      | BOLT                    |
| 12  | AN3C6A      | BOLT                    |
| 0   | AN3C7A      | BOLT                    |
| 44  | AN960C10L   | WASHER                  |

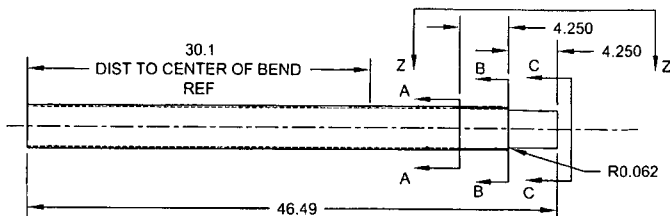
**GENERAL NOTES**

- 1) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- 2) SPRAY INSIDE OF TUBE WITH A COAT OF LPS LABORATORIES "LPS-3" AFTER FINISH AND AFTER INSTALLATION OF INSERTS. COAT ALL EXPOSED FASTENERS WITH LPS LABORATORIES "LPS PROCYON" AFTER FINAL ASSEMBLY, CLEAN EXCESS OFF POWDER COATING WITH MEK DEGREASER.
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 SIZE HOLES FOR WEARSHOE INSERTS. C'BORE AS NOTED AND INSTALL INSERTS EXCEPT WHERE INDICATED.

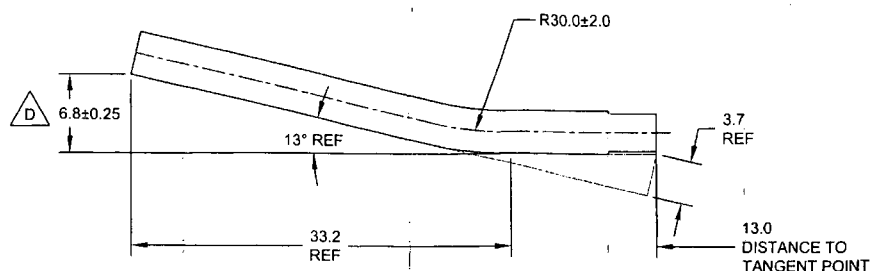
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|------------|----------|--|--------------|
| DESIGN     | PH       | <b>DART AEROSPACE USA, INC</b>   |              |
| DRAWN      | AUS      | PORT HADLOCK, WA   |              |
| CHECKED    |          | DRAWING NO.  | REV. H       |
| MFG. APPR. |          | D3391  | SHEET 2 OF 8 |
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DEO ATTACHED

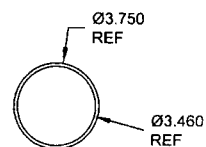
RELEASED  
08.09.25



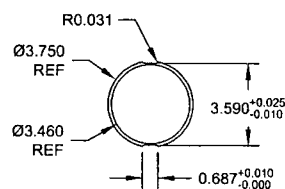
**D3391-1 CUTTING DETAIL**  
(MAKE FROM D6013-047 SKIDTUBE MATERIAL)



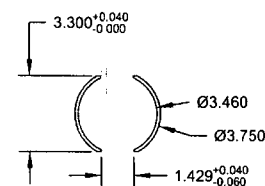
**D3391-011/-021 BENDING DETAIL**  
(MAKE FROM D3391-1)



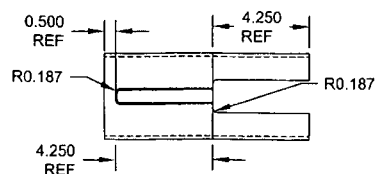
**SECTION A-A**  
SCALE 2X



**SECTION B-B**  
SCALE 2X



**SECTION C-C**  
SCALE 2X

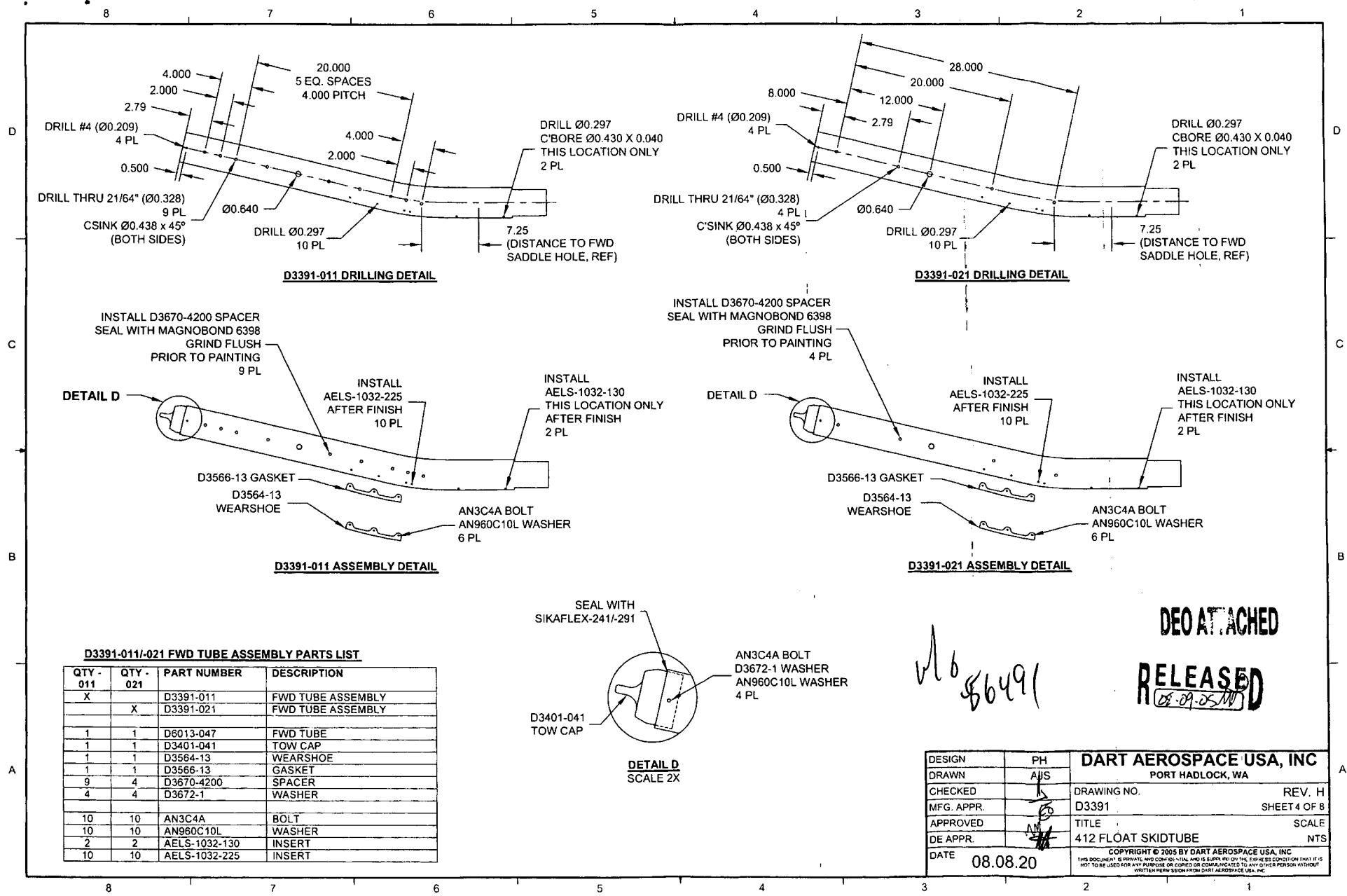


**VIEW Z-Z**  
SCALE 2X

*W6 56491*

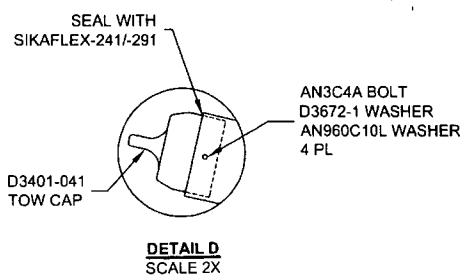
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**RELEASED**  
*8-21-05 NW*

|            |                    |  |        |
|------------|--------------------|--|--------|
| DESIGN     | PH                 | <b>DART AEROSPACE USA, INC</b>   |        |
| DRAWN      | AJS                | PORT HADLOCK, WA   |        |
| CHECKED    | <i>[Signature]</i> | DRAWING NO. D3391  | REV. H |
| MFG. APPR. | <i>[Signature]</i> | SHEET 3 OF 8   |        |
| APPROVED   | <i>[Signature]</i> | TITLE  | SCALE  |
| DE APPR.   | <i>[Signature]</i> | 412 FLOAT SKIDTUBE   | NTS    |
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**D3391-011/-021 FWD TUBE ASSEMBLY PARTS LIST**

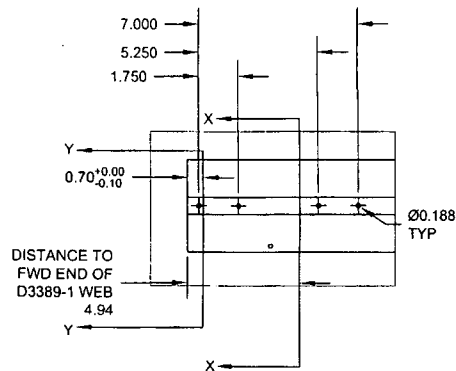
| QTY - 011 | QTY - 021 | PART NUMBER   | DESCRIPTION       |
|-----------|-----------|---------------|-------------------|
| X         |           | D3391-011     | FWD TUBE ASSEMBLY |
|           | X         | D3391-021     | FWD TUBE ASSEMBLY |
| 1         | 1         | D6013-047     | FWD TUBE          |
| 1         | 1         | D3401-041     | TOW CAP           |
| 1         | 1         | D3564-13      | WEARSHOE          |
| 1         | 1         | D3566-13      | GASKET            |
| 9         | 4         | D3670-4200    | SPACER            |
| 4         | 4         | D3672-1       | WASHER            |
| 10        | 10        | AN3C4A        | BOLT              |
| 10        | 10        | AN960C10L     | WASHER            |
| 2         | 2         | AELS-1032-130 | INSERT            |
| 10        | 10        | AELS-1032-225 | INSERT            |



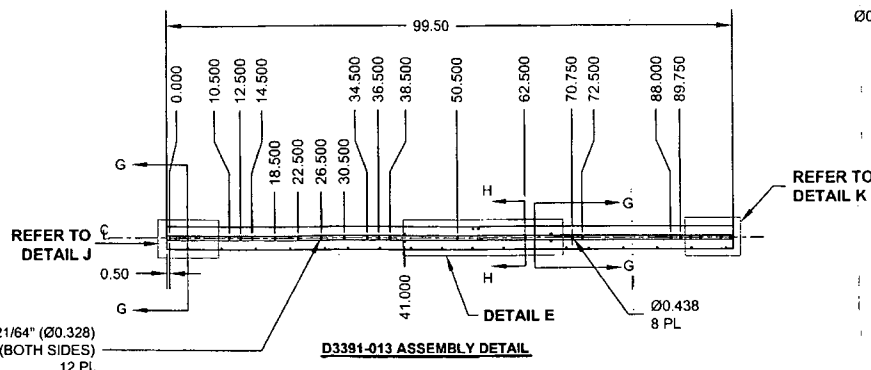
*Handwritten:* 16 86491

**DEO ATTACHED**  
**RELEASED**  
*Handwritten:* 08-09-25 M

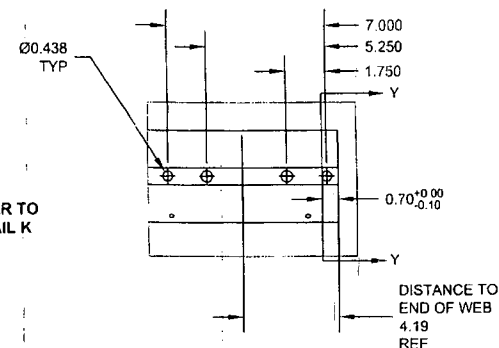
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|------------|----------|-----|---|--------------|
| DESIGN     |          | PH  | <b>DART AEROSPACE USA, INC</b>  |              |
| DRAWN      |          | AJS | PORT HADLOCK, WA  |              |
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| MFG. APPR. |          |     | D3391   | SHEET 4 OF 8 |
| APPROVED   |          |     | TITLE   | SCALE        |
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**DETAIL J**  
SCALE 4X



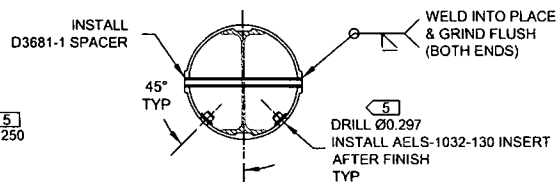
**D3391-013 ASSEMBLY DETAIL**



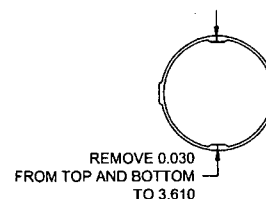
**DETAIL K**  
SCALE 4X



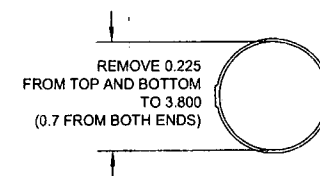
**SECTION G-G**  
SCALE 5X



**SECTION H-H**  
SCALE 5X



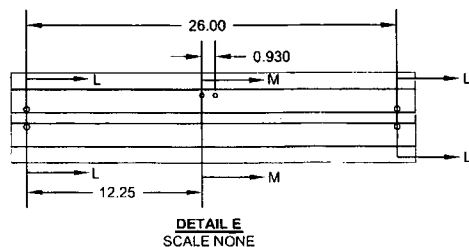
**SECTION X-X**  
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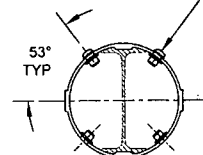
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SCALE 5X

**D3391-013 MID TUBE ASSEMBLY PARTS LIST**

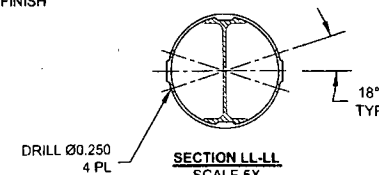
| QTY | PART NUMBER   | DESCRIPTION       |
|-----|---------------|-------------------|
| X   | D3391-013     | MID TUBE ASSEMBLY |
| 1   | D2500-1-100   | EXTRUSION         |
| 1   | D3389-1       | WEB               |
| 4   | D3672-1       | WASHER            |
| 4   | D3672-3       | WASHER            |
| 12  | D3681-1       | SPACER            |
| 24  | AELS-1032-130 | INSERT            |
| 4   | ALS4-428-165  | INSERT            |
| 4   | AN960C10L     | WASHER            |
| 4   | AN960C416L    | WASHER            |
| 4   | MS27039C1-09  | SCREW             |
| 4   | MS27039C4-08  | SCREW             |



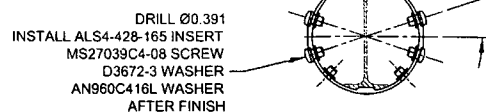
**DETAIL E**  
SCALE NONE



**SECTION M-M**  
SCALE 5X



**SECTION LL-LL**  
SCALE 5X



**SECTION L-L**  
SCALE 5X

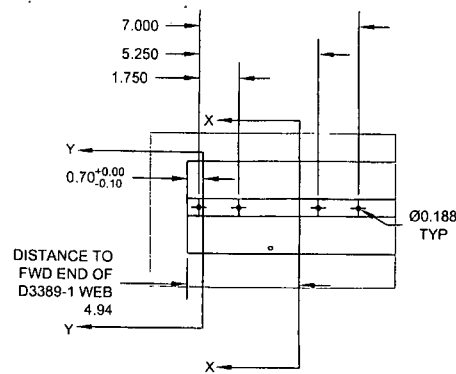
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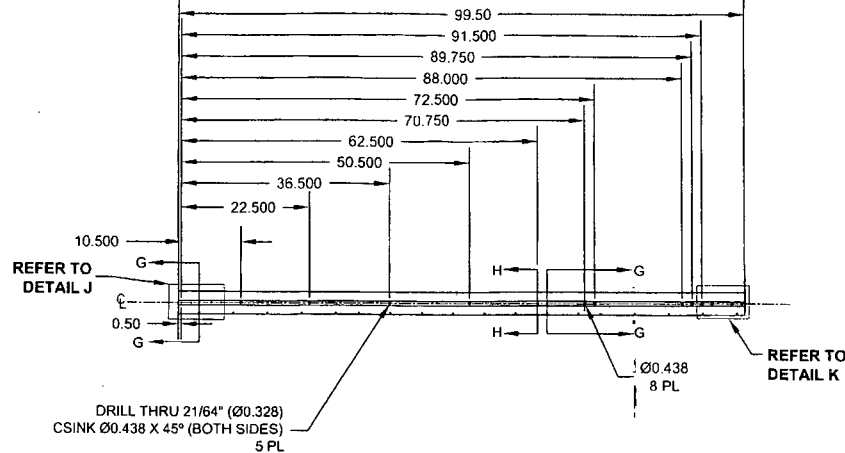
**D3391-013 MID TUBE ASSEMBLY**

- MATERIAL: MAKE FROM D2500-1-100 EXTRUSION
- INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-2411/291 PER QSI 015
- WELDING: PER DART QSI 004

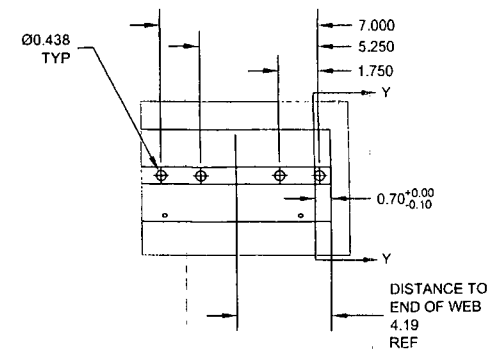
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|------------|----------|--|--------------|
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| MFG. APPR. |          | D3391  | SHEET 5 OF 8 |
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**DETAIL J**  
SCALE 4X



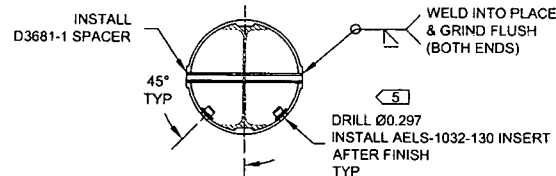
**D3391-023 ASSEMBLY DETAIL**



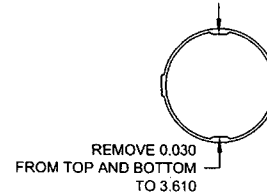
**DETAIL K**  
SCALE 4X



**SECTION G-G**  
SCALE 5X



**SECTION H-H**  
SCALE 5X



**SECTION X-X**  
SCALE 5X

REMOVE 0.225  
FROM TOP AND BOTTOM  
TO 3.800  
(0.7 FROM BOTH ENDS)

**SECTION Y-Y**  
SCALE 5X

**D3391-023 MID TUBE ASSEMBLY PARTS LIST**

| QTY - 023 | PART NUMBER   | DESCRIPTION       |
|-----------|---------------|-------------------|
| X         | D3391-023     | MID TUBE ASSEMBLY |
| 1         | D2500-1-100   | EXTRUSION         |
| 1         | D3389-1       | WEB               |
| 5         | D3681-1       | SPACER            |
| 20        | AELS-1032-130 | INSERT            |

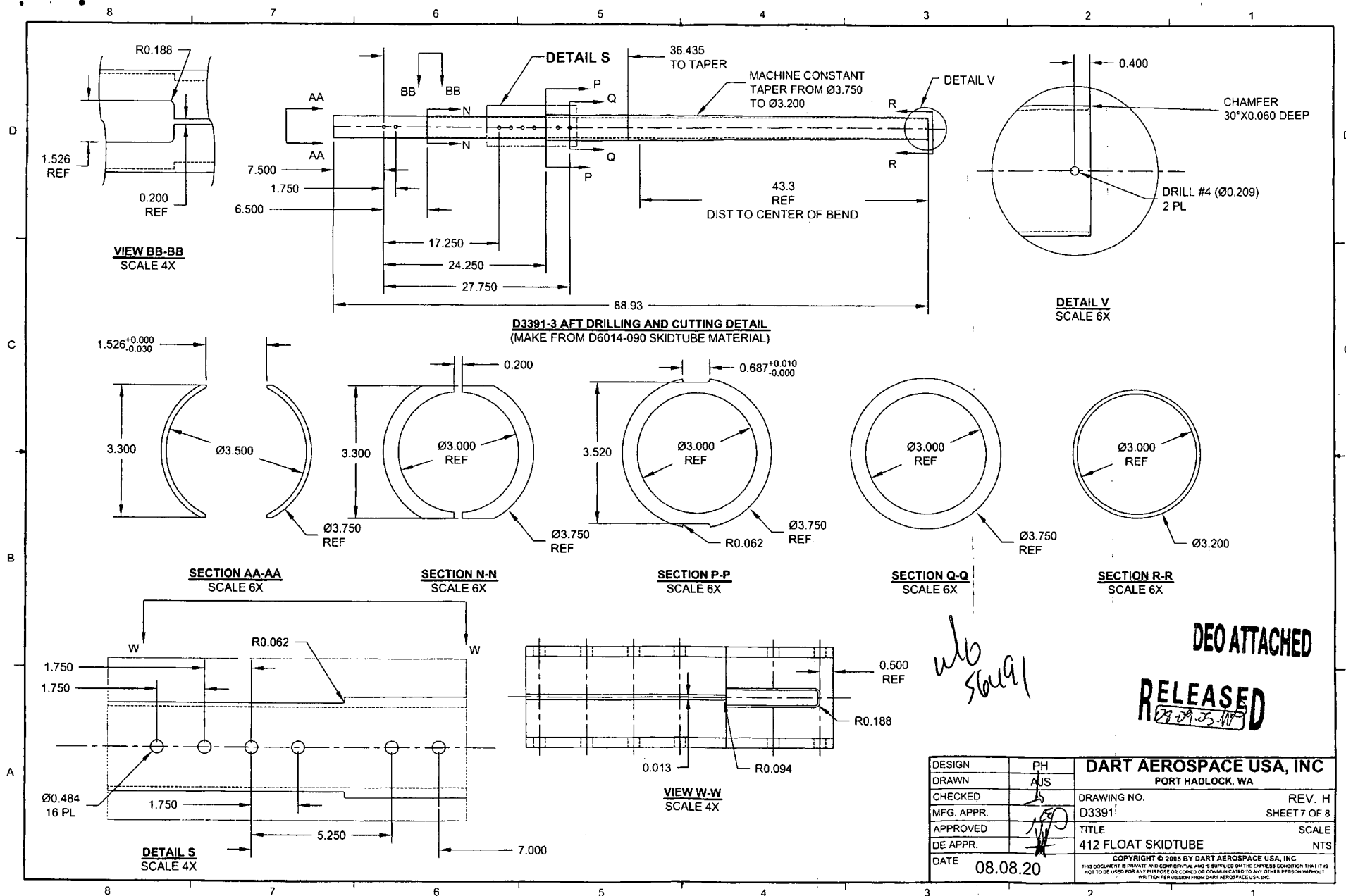
**D3391-023 MID TUBE ASSEMBLY**

- 1) MATERIAL: MAKE FROM D2500-1-100 EXTRUSION
- 2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-2411-291 PER QSI 015
- 3) WELDING: PER DART QSI 004

*WLO 56491*

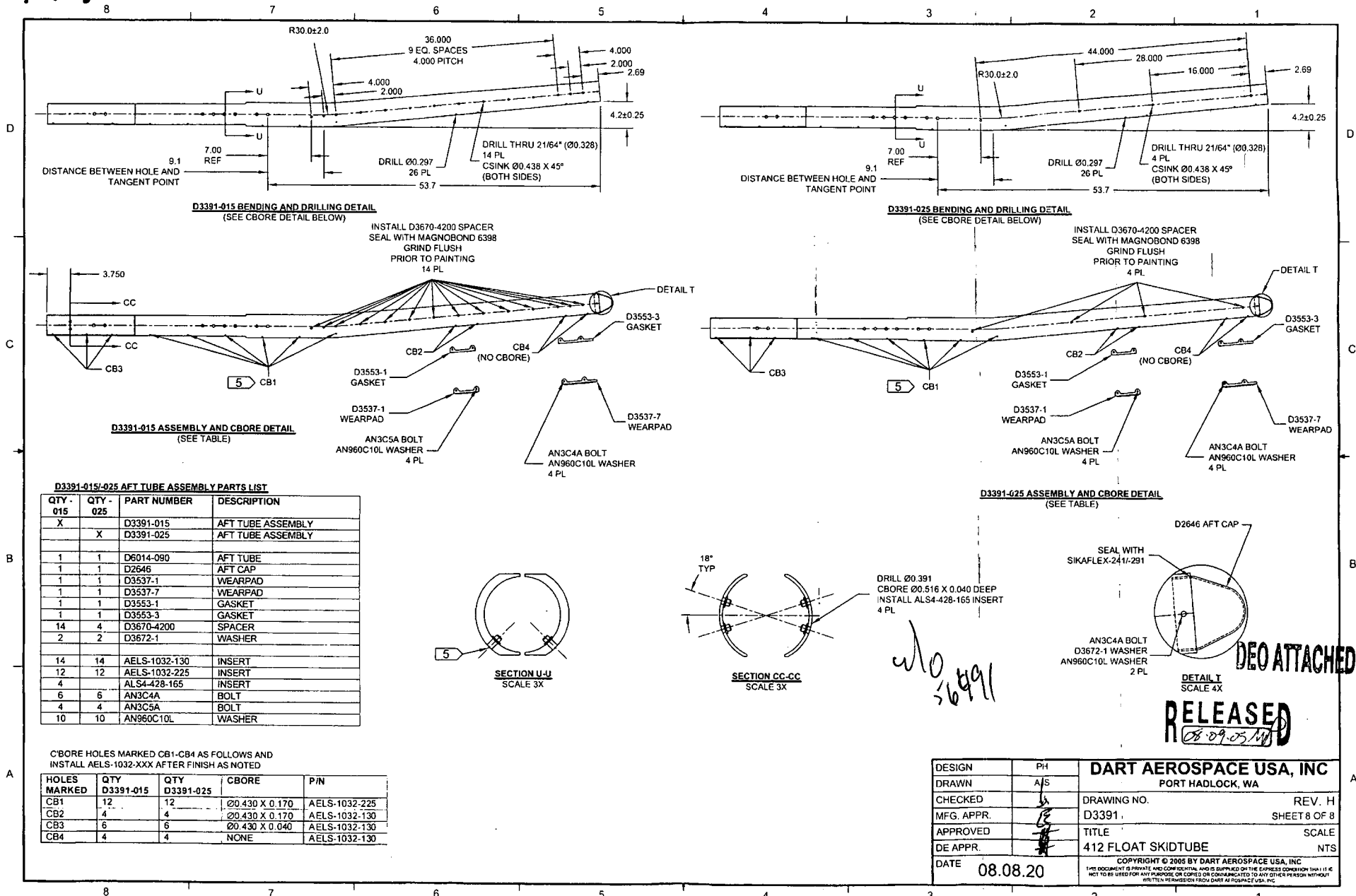
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**RELEASED**  
*08-09-05-14*

|            |          |   |
|------------|----------|---|
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| DRAWN      | A/S      | PORT HADLOCK, WA                            |
| CHECKED    |          | DRAWING NO. D3391                           |
| MFG. APPR. |          | REV. H SHEET 6 OF 8                         |
| APPROVED   |          | TITLE SCALE                                 |
| DE APPR.   |          | 412 FLOAT SKIDTUBE NTS                      |
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RELEASED  
27-09-05-118





|                      |                             |                     |  |  |                         |                           |              |
|----------------------|-----------------------------|---------------------|--|--|-------------------------|---------------------------|--------------|
| DRAWING NO.<br>D3391 | TITLE<br>412 FLOAT SKIDTUBE | REV. H              | DART AEROSPACE USA, INC<br>ENGINEERING ORDER |  | D.E.O. NO.<br>D3391-H-1 | SHEET NO.<br>SHEET 1 OF 1 | SCALE<br>NTS |
| DRAWN <i>UP</i>      | CHECKED <i>h</i>            | MFG. APPR. <i>W</i> | APPROVED <i>MP</i>                           |  | DE APPR. <i>W</i>       |                           |              |
| DATE 09.09.23        | DATE 04.04.24               | DATE 09/09/25       | DATE 09/09/30                                |  | DATE 09/09/30           |                           |              |

**PURPOSE:**

LPS-3 IS NO LONGER USED DURING ASSEMBLY OF D3391-041/-043 SKIDTUBES.

**CHANGE:**

AMEND NOTE 2 OF D3391-041/-043 SKIDTUBE ASSEMBLIES (ZN A6-1, A6-2) AS FOLLOWS:

- 2) ~~SPRAY INSIDE OF TUBE WITH A COAT OF LPS LABORATORIES "LPS-3" AFTER FINISH~~  
~~AND AFTER INSTALLATION OF INSERTS. COAT ALL EXPOSED FASTENERS WITH~~  
 LPS LABORATORIES "LPS PROCYON" AFTER FINAL ASSEMBLY, CLEAN EXCESS  
 OFF POWDER COATING WITH MEK DEGREASER.

**RELEASED**  
 2010-02-02

*MP*

*wlo 56491*

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NO. 224

AWS D17.1.2001  
QUALIFICATION TEST RECORD

Name: Burckley Elliott  
Job number: 53938  
Part number: D3391-023  
Description: Hot Mid tube  
Welding Process: Tig[☒] Mig[ ]  
Base material: Aluminum  
Current: AC[☒] DC[ ]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[ ]  
Penetration: pass[☒] fail[ ]

UNACCEPTABLE

Cracks: pass[☒] fail[ ]  
Undercut: pass[☒] fail[ ]  
Pin holes: pass[☒] fail[ ] ---  
Overlap (cold lap): pass[☒] fail[ ]  
Porosity (surface): pass[☒] fail[ ]  
Coloration: pass[☒] fail[ ]

Qualifier Hot Tube Date of Test Coupon 10-02-18

Welder Burckley Elliott Date of Test Coupon 10-02-18

The above named individual is qualified in accordance with AWS D17.1.2001 to weld